Receptor for advanced glycation end-products (RAGE) is an indicator of direct lung injury in models of experimental lung injury.

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Scientific Abstract:
Receptor for advanced glycation end-products (RAGE) is a marker of alveolar type I cells and is elevated in the pulmonary edema fluid of patients with acute lung injury (ALI). We tested the hypothesis that RAGE in the bronchoalveolar lavage (BAL) would be elevated in experimental models of direct ALI characterized by alveolar epithelial cell injury. We developed ELISA measurements for RAGE and studied ALI (direct and indirect) mouse models and collected BAL at specified endpoints to measure RAGE. We also tested whether levels of BAL RAGE correlated 1) with the severity of lung injury in acid and hyperoxia-induced ALI and 2) with the beneficial effect of a novel treatment, mesenchymal stem cells (MSC), in LPS-induced ALI. In ALI models of direct lung injury induced by intratracheal instillation of acid, LPS, or Escherichia coli, the BAL RAGE was 58-, 22-, and 13-fold elevated, respectively. In contrast, BAL RAGE was not detectable in indirect models of ALI induced by an intraperitoneal injection of thiourea or by an intravenous injection of MHC I monoclonal antibody that produces a mouse model of transfusion-related ALI. BAL RAGE did correlate with the severity of lung injury in acid and hyperoxia-induced ALI. In addition, with LPS-induced ALI, BAL RAGE was markedly reduced with MSC treatment. In summary, BAL RAGE is an indicator of ALI, and it may be useful in distinguishing direct from indirect models of ALI as well as assessing the response to specific therapies.